

CENTRAL PROCESSOR INSTRUCTION FORMAT

MACHINE CODE

| 1st.<br>CHARACTER | 2nd.<br>CHARACTER          | 3rd.<br>CHARACTER             | 4th.<br>CHARACTER           | 5th.<br>CHARACTER              |
|-------------------|----------------------------|-------------------------------|-----------------------------|--------------------------------|
| Operation<br>Code | Most<br>Significant<br>Row | Most<br>Significant<br>Column | Least<br>Significant<br>Row | Least<br>Significant<br>Column |

OPERATION                      M ADDRESS (OPERAND)

MODULE ADDRESSING:

For Central Processor Instructions the Module Designation of the Operand is determined by the "X" Bits of the 4th. and 5th. Characters. The following table of bits illustrates Bank Addressing.

| "X" BIT<br>CHAR. 4 | "X" BIT<br>CHAR. 5 | MODULE<br>DESIGNATION |
|--------------------|--------------------|-----------------------|
| ABSENT             | ABSENT             | 1                     |
| PRESENT            | ABSENT             | 2                     |
| ABSENT             | PRESENT            | 3                     |
| PRESENT            | PRESENT            | 4                     |

EXTERNAL FUNCTION INSTRUCTION FORMAT

MACHINE CODE

| 1st.<br>CHARACTER | 2nd.<br>CHARACTER    | 3rd.<br>CHARACTER    | 4th.<br>CHARACTER    | 5th.<br>CHARACTER    |
|-------------------|----------------------|----------------------|----------------------|----------------------|
| Function          | Sub<br>Function<br>A | Sub<br>Function<br>B | Sub<br>Function<br>C | Sub<br>Function<br>D |

1005 80-COLUMN CODE

| 80-Col.<br>Card<br>Code | Printable<br>Characters | XS-3<br>Code | 80-Col.<br>Card<br>Code | Printable<br>Characters | XS-3<br>Code |
|-------------------------|-------------------------|--------------|-------------------------|-------------------------|--------------|
| 12-1                    | A                       | 01 0100      | 7                       | 7                       | 00 1010      |
| 12-2                    | B                       | 01 0101      | 8                       | 8                       | 00 1011      |
| 12-3                    | C                       | 01 0110      | 9                       | 9                       | 00 1100      |
| 12-4                    | D                       | 01 0111      | 12                      | &                       | 01 0000      |
| 12-5                    | E                       | 01 1000      | 11                      | -(minus)                | 00 0010      |
| 12-6                    | F                       | 01 1001      | 12-0                    | ?                       | 01 0011      |
| 12-7                    | G                       | 01 1010      | 11-0                    | !(exclom.)              | 10 0011      |
| 12-8                    | H                       | 01 1011      | 0-1                     | /                       | 11 0100      |
| 12-9                    | I                       | 01 1100      | 2-8                     | +                       | 11 0011      |
| 11-1                    | J                       | 10 0100      | 3-8                     | #                       | 01 1101      |
| 11-2                    | K                       | 10 0101      | 4-8                     | @                       | 10 1110      |
| 11-3                    | L                       | 10 0110      | 5-8                     | :(colon)                | 01 0001      |
| 11-4                    | M                       | 10 0111      | 6-8                     | >                       | 11 1110      |
| 11-5                    | N                       | 10 1000      | 7-8                     | '(apos.)                | 10 0000      |
| 11-6                    | O                       | 10 1001      | 12-3-8                  | .(period)               | 01 0010      |
| 11-7                    | P                       | 10 1010      | 12-4-8                  | ⌈                       | 11 1101      |
| 11-8                    | Q                       | 10 1011      | 12-5-8                  | ⌊                       | 00 1111      |
| 11-9                    | R                       | 10 1100      | 12-6-8                  | <                       | 01 1110      |
| 0-2                     | S                       | 11 0101      | 12-7-8                  | =                       | 01 1111      |
| 0-3                     | T                       | 11 0110      | 11-3-8                  | \$                      | 10 0010      |
| 0-4                     | U                       | 11 0111      | 11-4-8                  | *                       | 10 0001      |
| 0-5                     | V                       | 11 1000      | 11-5-8                  | }                       | 00 0001      |
| 0-6                     | W                       | 11 1001      | 11-6-8                  | ;(semi-col)             | 00 1110      |
| 0-7                     | X                       | 11 1010      | 11-7-8                  | Δ                       | 10 1111      |
| 0-8                     | Y                       | 11 1011      | 0-2-8                   | ≠                       | 11 0000      |
| 0-9                     | Z                       | 11 1100      | 0-3-8                   | ,(commo)                | 11 0010      |
| 0                       | 0                       | 00 0011      | 0-4-8                   | %                       | 11 0001      |
| 1                       | 1                       | 00 0100      | 0-5-8                   | (                       | 10 1101      |
| 2                       | 2                       | 00 0101      | 0-6-8                   | \                       | 00 1101      |
| 3                       | 3                       | 00 0110      | 0-7-8                   | )                       | 11 1111      |
| 4                       | 4                       | 00 0111      |                         |                         |              |
| 5                       | 5                       | 00 1000      | Blank                   | Spoce N.P.              | 00 0000      |
| 6                       | 6                       | 00 1001      |                         |                         |              |

MEMORY MATRIX

ROW AND COLUMN MACHINE CODE

| 1  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
|----|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Sp | ] | 0 | 4 | : | I | F | . | 1 | 5  | :  | -  | 2  | 7  | B  | 8  | D  | C  | <  | #  | H  | C  | \  | G  | A  | 6  | ?  | 3  | 9  | E  | &  | -  |
| I  | * | 1 | M | 2 | Z | W | . | J | N  | %  | \$ | K  | P  | S  | Q  | U  | Δ  | >  | ⌈  | Y  | T  | (  | X  | /  | 0  | +  | L  | R  | V  | ≠  | )  |

X ABSENT

X PRESENT



UNIVAC<sup>®</sup>  
1005

EXTENDED SYSTEM

CODE  
CARD

# CENTRAL PROCESSOR INSTRUCTION REPERTOIRE

|            | SAAL<br>OP | OPER   | DESCRIPTION                      | MACH<br>CODE |    | OPERATION                                      |
|------------|------------|--------|----------------------------------|--------------|----|--|
|            |            |        |                                  | L1           | L2 |  |
| TRANSFER   | LAr        | M, L   | Load Ascending ARI or 2          | Sp           | P  | (Mem) → (ARI or 2)                             |
|            | LDr        | M, L   | Load Descending ARI or 2         | J            | *  | (Mem) → (ARI or 2)                             |
|            | LPR        | M, L   | Load Print Descending            | Ø            |    | (Mem) → (Print Buffer)                         |
|            | SAr        | M, L   | Store Ascending ARI or 2         | 4            | M  | (ARI or 2) → (Mem)                             |
|            | SDr        | M, L   | Store Descending ARI or 2        | ;            | @  | (ARI or 2) → (Mem)                             |
|            | SPR        | M, L   | Store Print Descending           | I            |    | (Print Buffer) → (Mem)                         |
|            | SHR        | M, L S | Shift Right                      | F            |    | (Mem) → (Mem Ascending)                        |
|            | SHL        | M, L S | Shift Left                       | .            |    | (Mem) → (Mem Descending)                       |
|            | CLR        | M, L   | Clear Area to Spaces             | i            |    | Spaces → (Mem)                                 |
|            | SC         | M, L C | Store Character                  | ≠            |    | C → (Mem)                                      |
| COMPARE    | CAr        | M, L   | Compare Alpha ARI or 2           | 5            | N  | (ARI or 2) : (Mem) Alpha Numeric               |
|            | CNr        | M, L   | Compare Numeric ARI or 2         | :            | %  | (ARI or 2) : (Mem) Algebraic                   |
|            | IC         | M      | Increment and Compare            | —            |    | (Mem) → Update → (Mem)                         |
|            | CCA        | M, L C | Compare Character Alpha          | ≠            |    | (Mem) : C Alpha Numeric                        |
| JUMP LOGIC | J          | M      | Jump Unconditional               | 2            |    | (Branch) → (Mem)                               |
|            | JG         | M      | Jump Greater (Numeric)           | B            |    | (Branch) → (Mem) if Greater                    |
|            | JL         | M      | Jump Less Than (Numeric)         | 7            |    | (Branch) → (Mem) if Less                       |
|            | JL         | M      | Jump Equal (Numeric)             | 7            |    | (Branch) → (Mem) if Equal                      |
|            | JEA        | M      | Jump Equal (Alpha Numeric)       | 7            |    | (Branch) → (Mem) if Equal                      |
|            | JUA        | M      | Jump Unequal (Alpha Numeric)     | 7            |    | (Branch) → (Mem) if Unequal                    |
|            | JP         | M      | Jump Positive (Arithmetic)       | 7            |    | (Branch) → (Mem) if Positive                   |
|            | JN         | M      | Jump Negative (Arithmetic)       | 8            |    | (Branch) → (Mem) if Negative                   |
|            | JZ         | M      | Jump Zero (IC & Arithmetic)      | 8            |    | (Branch) → (Mem) if Zero                       |
|            | JR         | M      | Store PAK in X REG → Jump        | ?            |    | (PAK) → (X REG), (Branch) → (Mem)              |
|            | JX         | M      | Store X REG in M                 | C            |    | (X REG) → (Mem)                                |
|            | JSS        | M      | Jump Alt Switch 3                | V            |    | (Branch) → (Mem) if Alternate Switch 3 on      |
|            | JOE        | M      | Jump Arithmetic Overflow         | V            |    | (Branch) → (Mem) if Arithmetic Overflow        |
|            | AMr        | M, L   | Add A/g: ARI or 2 to M           | <            | >  | (ARI or 2) + (Mem) → (Mem) w Sign Compare      |
|            | JOE        | M, L   | Add A/g: M to ARI or 2           | #            | ±  | (Mem) + (ARI or 2) → (ARI or 2) w Sign Compare |
|            | SMr        | M, L   | Subtract A/g: ARI or 2 from M    | H            | Y  | (Mem) - (ARI or 2) → (Mem) w Sign Compare      |
| ARITHMETIC | SRr        | M, L   | Subtract A/g: M from ARI or 2    | C            | T  | (ARI or 2) - (Mem) → (ARI or 2) w Sign Compare |
|            | MUL        | M, L   | Multiply                         | <            |    | (Mem) × (ARI) → (AR2)                          |
|            | DIV        | M, L   | Divide                           | G            |    | (AR2) ÷ (Mem) → (ARI and 2)                    |
|            | TRL        | M, L   | Translate                        | <            |    | (Mem) → (Mem) Translated                       |
| EDIT       | SZS        | M, L   | Ø Suppress AR2 & Store Ascending | Ø            |    | (AR2 Edited) → (Mem)                           |
|            | LWS        | M, L   | Load AR2 w Sign & Zone Delete    | ?            |    | (Mem) → (AR2 with Edit)                        |
|            | LNR        | M, L   | Zone Delete ARI or 2             | 3            | L  | (Mem) → (ARI or 2 w Zone Delete)               |
|            | SED        | M, L   | Edit ... AR2 & Store Ascending   | R            |    | (AR2 Edited) → (Mem)                           |
|            | LAN        | M, L C | Logical And                      | ≠            |    | (M) ∧ C → (M)                                  |
|            | LDN        | M, L C | Logical Or                       | ≠            |    | (M) ∨ C → (M)                                  |
|            | BSN        | M, L   | Bit Shift Circularly             | ≠            |    | Shift (1 Chi Mem) Circularly One Bit           |

r = Register 1 or 2  
M = Most Significant Location  
L = Length of Operand  
S = Number of Shift Positions  
C = Character Stored in the Instruction  
A = Logical And  
V = Logical Or

# INPUT/OUTPUT - INSTRUCTION REPERTOIRE

|                      | SAAL<br>OP | OPER   | DESCRIPTION                      | MACH<br>CODE | OPERATION   |
|----------------------|------------|--|----------------------------------|--------------|---|
|                      |            |  |                                  |              |   |
| CARD SYSTEM          | PTE        |  | Punch Test                       | E            | (Processor Interlock) If Punch Active   |
|                      | XF         | REA  | Read Card                        | &            | Card → (Card Buffer)  |
|                      | XF         | PR1  | Print - SP1                      | &            | (Print Buffer) → Printer SP1  |
|                      | XF         | PR2  | Print - SP2                      | &            | (Print Buffer) → Printer SP2  |
|                      | XF         | PR7  | Print - SK7                      | &            | (Print Buffer) → Printer → Channel 7 On Loop  |
|                      | XF         | PUN  | Punch                            | &            | (Punch Buffer) → Punch  |
|                      | XF         | RPR  | Read - Print - SP1               | &            | Card → (Card Buffer) (Print Buffer) → Printer - SP1   |
|                      | XF         | RP2  | Read - Print - SP2               | &            | Card → (Card Buffer) (Print Buffer) → Printer - SP2   |
|                      | XF         | RPH  | Read - Punch                     | &            | Card → (Card Buffer) (Punch Buffer) → Punch   |
|                      | XF         | RPP  | Read - Print - SP1 - Punch       | &            | Card → (Card Buffer) (Print Buffer) → Printer - SP1 (Punch Buffer) → Punch                      |
| CARD SYSTEM          | XF         | SH2  | Skip 2                           | &            | (Advance Paper) → Channel 2 On Loop   |
|                      | XF         | SX4  | Skip 4                           | &            | (Advance Paper) → Channel 4 On Loop   |
|                      | XF         | SX7  | Skip 7                           | &            | (Advance Paper) → Channel 7 On Loop   |
|                      | XF         | RCI  | Read Code Image                  | &            | Card → (Buffer Code Image)  |
|                      | XF         | PCI  | Punch Code Image                 | &            | (Punch Buffer Code Image) → Punch   |
|                      | XF         | RXC  | Read Auxiliary Code Image        | &            | Card Aux Reader → (Buffer Code Image)   |
|                      | XF         | RX1  | Read Auxiliary Strk Sel 1        | &            | Card Aux Reader → (Buffer) Strk Sel 1   |
|                      | XF         | RX2  | Read Auxiliary Strk Sel 2        | &            | Card Aux Reader → (Buffer) Strk Sel 2   |
|                      | XF         | RRS  | Read Auxiliary Strk Sel 3        | ≠            | Card Aux Reader → (Buffer) Strk Sel 3   |
|                      | XF         | PSS  | Punch Strk Sel                   | &            | (Punch Buffer) → Punch Strk Sel   |
| TAPE                 | XF         | RRP  | Read Read Punch                  | ≠            | Card Punch → (Read/Punch Input Buffer) (Read Punch Output Buffer) → Punch                       |
|                      | XF         | RRS  | Read Read Punch Strk Sel         | &            | Card Punch → (Read/Punch Input Buffer) (Read Punch Output Buffer) → Punch Strk Sel              |
|                      | XF         | RRC  | Read Read Punch Code Image       | &            | Card Punch → (Read/Punch Input Buffer Code Image) (Read Punch Output Buffer Code Image) → Punch |
|                      | XF         | RFC  | Special Instructions             | &            | Input Output Card System Combinations   |
|                      | XF         | RP1  | Read Paper Tape 1 Frame          | &            | Paper Tape → (Buffer) 1 Frame   |
|                      | XF         | RP8  | Read Paper Tape 80 Frames        | &            | Paper Tape → (Buffer) 80 Frames   |
|                      | XF         | RPS  | Read Paper Tape Through Sentinel | &            | Paper Tape → (Buffer) Through Sentinel  |
|                      | XF         | PP1  | Punch Paper Tape 1 Frame         | ≠            | (Punch Buffer 1 Frame) → Paper Tape Punch (No Parity)   |
|                      | XF         | PPS  | Punch Paper Tape To Sentinel     | &            | (Punch Buffer To Sentinel) → Paper Tape Punch (No Parity)                                       |
|                      | XF         | P1P  | Punch Paper Tape 1 Frame         | ≠            | (Punch Buffer 1 Frame) → Paper Tape Punch (w/Parity)  |
| MAGNETIC TAPE        | XF         | PSP  | Punch Paper Tape To Sentinel     | ≠            | (Punch Buffer To Sentinel) → Paper Tape Punch (w/Parity)  |
|                      | JPE        | M  | Jump Parity Error                | V            | Branch → (Mem) if Parity Error  |
|                      | JCO        | M  | Jump Channel 8                   | V            | Branch → (Mem) if Channel 8   |
|                      | XF         | RT <sub>0</sub> BF <sub>n</sub> L                | Read Tape Normal Gain            | ≠            | Mag Tape → (Buffer) Normal Gain   |
|                      | XF         | RT <sub>0</sub> + <sub>4</sub> BF <sub>n</sub> L | Read Tape High Gain              | ≠            | Mag Tape → (Buffer) High Gain   |
|                      | XF         | WT <sub>0</sub> BF <sub>n</sub> L                | Write Tape                       | ≠            | (Buffer) → Mag Tape   |
|                      | XF         | ER <sub>0</sub> BF <sub>n</sub> L                | Erase Before Write               | ≠            | Erase Mag Tape → (Buffer) → Mag Tape  |
|                      | XF         | BS <sub>0</sub>                                  | Backspace 1 Block                | ≠            | Backspace   |
|                      | XF         | HW <sub>0</sub>                                  | Rewind Servo                     | ≠            | Rewind  |
|                      | JPE        | M  | Jump Parity Error                | V            | Branch → (Mem) if Parity Error  |
| DATA LINE TERMINAL 3 | JET        | M  | Jump End of Tape                 | V            | Branch → (Mem) if End of Tape   |
|                      | XF         | SH8  | Send DLT 80 Characters           | V            | (Buffer) → DLT 80 Characters  |
|                      | XF         | SHS  | Send DLT Through Sentinel        | V            | (Buffer) → DLT  |
|                      | XF         | RCO  | Receive DLT to EDM               | V            | (DLT) → Buffer  |
|                      | JPE        | M  | Jump Parity Error                | V            | Branch → (Mem) if Parity Error  |
|                      | JET        | M  | Jump End of Time                 | V            | Branch → (Mem) if End of Time (No Traffic 20 Seconds)   |
|                      | PTE        |  | Pause Test DLT                   | E            | (Processor Interlock) If DLT Active   |
|                      | XF         | Sl <sub>0</sub> BF <sub>n</sub> L                | Send Buffer to 1001              | V            | L Buffer Characters → 1001 Buffer   |
|                      | XF         | Rl <sub>0</sub> BF <sub>n</sub> L                | Receive from 1001                | V            | (Data) → Buffer   |
|                      | J11        | M  | Jump Interrupt Unit 1            | V            | Branch → (Mem) if 1001 Ready  |
| 1001                 | JAL        | M  | Jump Alert                       | V            | Branch → (Mem) if 1001 Interlocked  |

S = Servo Number  
BF<sub>n</sub> = Memory Module (1 through 4)  
L = Length of Operand

# 1005 INPUT/OUTPUT- STORAGE AREAS

| ROW   | COLUMN |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | 32 |
|---|--------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----|
|   | 1      | 2   | 3   | 4   | 5   | 6   | 7   | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   | 21   | 22   | 23   | 24   | 25   | 26   | 27   | 28   | 29   | 30   | 31   |      |    |
| 1   | 1      | 2   | 3   | 4   | 5   | 6   | 7   | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   | 21   | 22   | 23   | 24   | 25   | 26   | 27   | 28   | 29   | 30   | 31   | 32   |    |
| 2   | 33     | 34  | 35  | 36  | 37  | 38  | 39  | 40   | 41   | 42   | 43   | 44   | 45   | 46   | 47   | 48   | 49   | 50   | 51   | 52   | 53   | 54   | 55   | 56   | 57   | 58   | 59   | 60   | 61   | 62   | 63   | 64   |    |
| 3   | 65     | 66  | 67  | 68  | 69  | 70  | 71  | 72   | 73   | 74   | 75   | 76   | 77   | 78   | 79   | 80   | 81   | 82   | 83   | 84   | 85   | 86   | 87   | 88   | 89   | 90   | 91   | 92   | 93   | 94   | 95   | 96   |    |
| 4   | 97     | 98  | 99  | 100 | 101 | 102 | 103 | 104  | 105  | 106  | 107  | 108  | 109  | 110  | 111  | 112  | 113  | 114  | 115  | 116  | 117  | 118  | 119  | 120  | 121  | 122  | 123  | 124  | 125  | 126  | 127  | 128  |    |
| 5   | 129    | 130 | 131 | 132 | 133 | 134 | 135 | 136  | 137  | 138  | 139  | 140  | 141  | 142  | 143  | 144  | 145  | 146  | 147  | 148  | 149  | 150  | 151  | 152  | 153  | 154  | 155  | 156  | 157  | 158  | 159  | 160  |    |
| 6   | 161    | 162 | 163 | 164 | 165 | 166 | 167 | 168  | 169  | 170  | 171  | 172  | 173  | 174  | 175  | 176  | 177  | 178  | 179  | 180  | 181  | 182  | 183  | 184  | 185  | 186  | 187  | 188  | 189  | 190  | 191  | 192  |    |
| 7   | 193    | 194 | 195 | 196 | 197 | 198 | 199 | 200  | 201  | 202  | 203  | 204  | 205  | 206  | 207  | 208  | 209  | 210  | 211  | 212  | 213  | 214  | 215  | 216  | 217  | 218  | 219  | 220  | 221  | 222  | 223  | 224  |    |
| 8   | 225    | 226 | 227 | 228 | 229 | 230 | 231 | 232  | 233  | 234  | 235  | 236  | 237  | 238  | 239  | 240  | 241  | 242  | 243  | 244  | 245  | 246  | 247  | 248  | 249  | 250  | 251  | 252  | 253  | 254  | 255  | 256  |    |
| 9   | 257    | 258 | 259 | 260 | 261 | 262 | 263 | 264  | 265  | 266  | 267  | 268  | 269  | 270  | 271  | 272  | 273  | 274  | 275  | 276  | 277  | 278  | 279  | 280  | 281  | 282  | 283  | 284  | 285  | 286  | 287  | 288  |    |
| 10  | 289    | 290 | 291 | 292 | 293 | 294 | 295 | 296  | 297  | 298  | 299  | 300  | 301  | 302  | 303  | 304  | 305  | 306  | 307  | 308  | 309  | 310  | 311  | 312  | 313  | 314  | 315  | 316  | 317  | 318  | 319  | 320  |    |
| 11  | 321    | 322 | 323 | 324 | 325 | 326 | 327 | 328  | 329  | 330  | 331  | 332  | 333  | 334  | 335  | 336  | 337  | 338  | 339  | 340  | 341  | 342  | 343  | 344  | 345  | 346  | 347  | 348  | 349  | 350  | 351  | 352  |    |
| 12  | 353    | 354 | 355 | 356 | 357 | 358 | 359 | 360  | 361  | 362  | 363  | 364  | 365  | 366  | 367  | 368  | 369  | 370  | 371  | 372  | 373  | 374  | 375  | 376  | 377  | 378  | 379  | 380  | 381  | 382  | 383  | 384  |    |
| 13  | 385    | 386 | 387 | 388 | 389 | 390 | 391 | 392  | 393  | 394  | 395  | 396  | 397  | 398  | 399  | 400  | 401  | 402  | 403  | 404  | 405  | 406  | 407  | 408  | 409  | 410  | 411  | 412  | 413  | 414  | 415  | 416  |    |
| 14  | 417    | 418 | 419 | 420 | 421 | 422 | 423 | 424  | 425  | 426  | 427  | 428  | 429  | 430  | 431  | 432  | 433  | 434  | 435  | 436  | 437  | 438  | 439  | 440  | 441  | 442  | 443  | 444  | 445  | 446  | 447  | 448  |    |
| 15  | 449    | 450 | 451 | 452 | 453 | 454 | 455 | 456  | 457  | 458  | 459  | 460  | 461  | 462  | 463  | 464  | 465  | 466  | 467  | 468  | 469  | 470  | 471  | 472  | 473  | 474  | 475  | 476  | 477  | 478  | 479  | 480  |    |
| 16  | 481    | 482 | 483 | 484 | 485 | 486 | 487 | 488  | 489  | 490  | 491  | 492  | 493  | 494  | 495  | 496  | 497  | 498  | 499  | 500  | 501  | 502  | 503  | 504  | 505  | 506  | 507  | 508  | 509  | 510  | 511  | 512  |    |
| 17  | 513    | 514 | 515 | 516 | 517 | 518 | 519 | 520  | 521  | 522  | 523  | 524  | 525  | 526  | 527  | 528  | 529  | 530  | 531  | 532  | 533  | 534  | 535  | 536  | 537  | 538  | 539  | 540  | 541  | 542  | 543  | 544  |    |
| 18  | 545    | 546 | 547 | 548 | 549 | 550 | 551 | 552  | 553  | 554  | 555  | 556  | 557  | 558  | 559  | 560  | 561  | 562  | 563  | 564  | 565  | 566  | 567  | 568  | 569  | 570  | 571  | 572  | 573  | 574  | 575  | 576  |    |
| 19  | 577    | 578 | 579 | 580 | 581 | 582 | 583 | 584  | 585  | 586  | 587  | 588  | 589  | 590  | 591  | 592  | 593  | 594  | 595  | 596  | 597  | 598  | 599  | 600  | 601  | 602  | 603  | 604  | 605  | 606  | 607  | 608  |    |
| 20  | 609    | 610 | 611 | 612 | 613 | 614 | 615 | 616  | 617  | 618  | 619  | 620  | 621  | 622  | 623  | 624  | 625  | 626  | 627  | 628  | 629  | 630  | 631  | 632  | 633  | 634  | 635  | 636  | 637  | 638  | 639  | 640  |    |
| 21  | 641    | 642 | 643 | 644 | 645 | 646 | 647 | 648  | 649  | 650  | 651  | 652  | 653  | 654  | 655  | 656  | 657  | 658  | 659  | 660  | 661  | 662  | 663  | 664  | 665  | 666  | 667  | 668  | 669  | 670  | 671  | 672  |    |
| 22  | 673    | 674 | 675 | 676 | 677 | 678 | 679 | 680  | 681  | 682  | 683  | 684  | 685  | 686  | 687  | 688  | 689  | 690  | 691  | 692  | 693  | 694  | 695  | 696  | 697  | 698  | 699  | 700  | 701  | 702  | 703  | 704  |    |
| 23  | 705    | 706 | 707 | 708 | 709 | 710 | 711 | 712  | 713  | 714  | 715  | 716  | 717  | 718  | 719  | 720  | 721  | 722  | 723  | 724  | 725  | 726  | 727  | 728  | 729  | 730  | 731  | 732  | 733  | 734  | 735  | 736  |    |
| 24  | 737    | 738 | 739 | 740 | 741 | 742 | 743 | 744  | 745  | 746  | 747  | 748  | 749  | 750  | 751  | 752  | 753  | 754  | 755  | 756  | 757  | 758  | 759  | 760  | 761  | 762  | 763  | 764  | 765  | 766  | 767  | 768  |    |
| 25  | 769    | 770 | 771 | 772 | 773 | 774 | 775 | 776  | 777  | 778  | 779  | 780  | 781  | 782  | 783  | 784  | 785  | 786  | 787  | 788  | 789  | 790  | 791  | 792  | 793  | 794  | 795  | 796  | 797  | 798  | 799  | 800  |    |
| 26  | 801    | 802 | 803 | 804 | 805 | 806 | 807 | 808  | 809  | 810  | 811  | 812  | 813  | 814  | 815  | 816  | 817  | 818  | 819  | 820  | 821  | 822  | 823  | 824  | 825  | 826  | 827  | 828  | 829  | 830  | 831  | 832  |    |
| 27  | 833    | 834 | 835 | 836 | 837 | 838 | 839 | 840  | 841  | 842  | 843  | 844  | 845  | 846  | 847  | 848  | 849  | 850  | 851  | 852  | 853  | 854  | 855  | 856  | 857  | 858  | 859  | 860  | 861  | 862  | 863  | 864  |    |
| 28  | 865    | 866 | 867 | 868 | 869 | 870 | 871 | 872  | 873  | 874  | 875  | 876  | 877  | 878  | 879  | 880  | 881  | 882  | 883  | 884  | 885  | 886  | 887  | 888  | 889  | 890  | 891  | 892  | 893  | 894  | 895  | 896  |    |
| 29  | 897    | 898 | 899 | 900 | 901 | 902 | 903 | 904  | 905  | 906  | 907  | 908  | 909  | 910  | 911  | 912  | 913  | 914  | 915  | 916  | 917  | 918  | 919  | 920  | 921  | 922  | 923  | 924  | 925  | 926  | 927  | 928  |    |
| 30  | 929    | 930 | 931 | 932 | 933 | 934 | 935 | 936  | 937  | 938  | 939  | 940  | 941  | 942  | 943  | 944  | 945  | 946  | 947  | 948  | 949  | 950  | 951  | 952  | 953  | 954  | 955  | 956  | 957  | 958  | 959  | 960  |    |
| 31  | 961    | 962 | 963 | 964 | 965 | 966 | 967 | 968  | 969  | 970  | 971  | 972  | 973  | 974  | 975  | 976  | 977  | 978  | 979  | 980  | 981  | 982  | 983  | 984  | 985  | 986  | 987  | 988  | 989  | 990  | 991  | 992  |    |
| 32  | 993    | 994 | 995 | 996 | 997 | 998 | 999 | 1000 | 1001 | 1002 | 1003 | 1004 | 1005 | 1006 | 1007 | 1008 | 1009 | 1010 | 1011 | 1012 | 1013 | 1014 | 1015 | 1016 | 1017 | 1018 | 1019 | 1020 | 1021 | 1022 | 1023 | 1024 |    |
| STATIC REGISTERS                                |        |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |    |
| READ      TRANSLATE TABLE      PRINT      PUNCH |        |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |    |